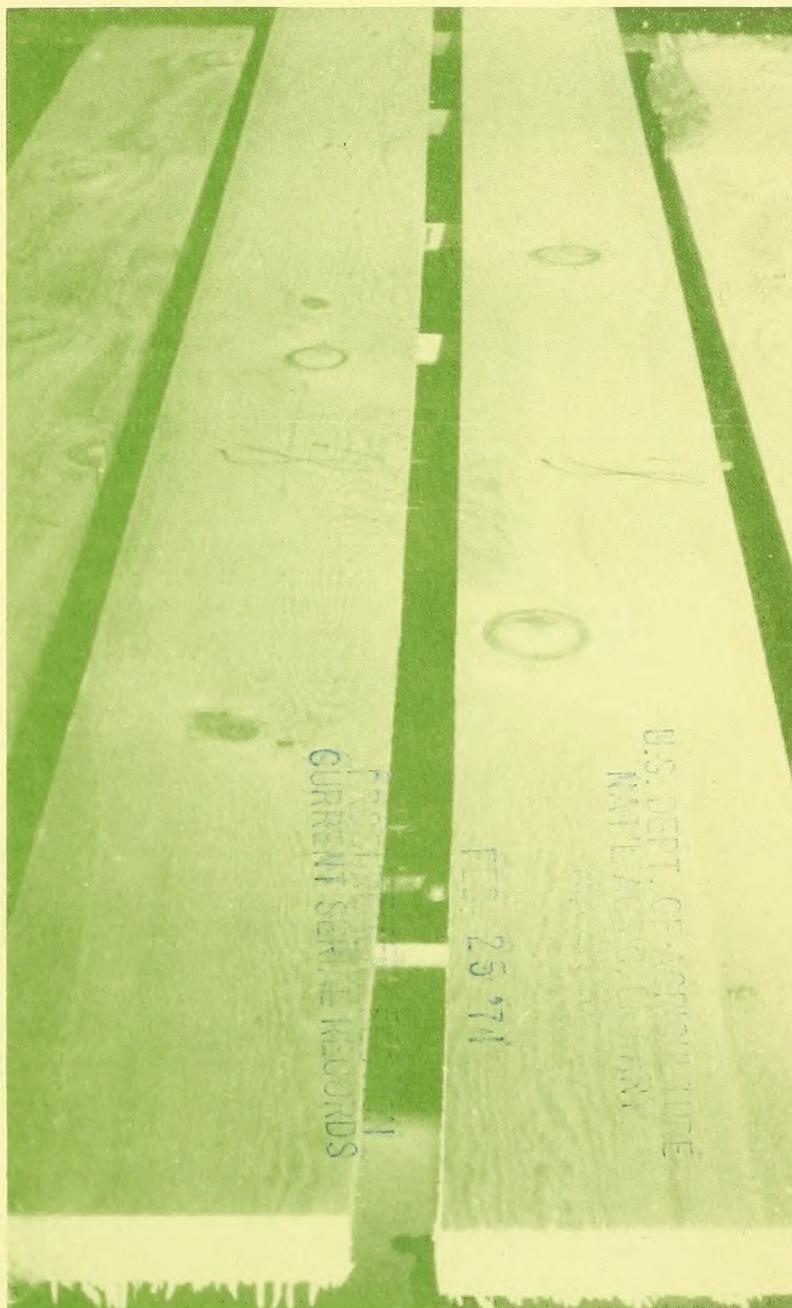


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2001-2001
**LUMBER
YIELD**



U.S. DEPT. OF AGRICULTURE
FOREST SERVICE
CURRENT SERVICE RECORDS

153-25-74

FROM
WESTERN WHITE PINE
IN NORTHERN IDAHO

153, 30p. map. 1973.

25
MARLIN E. PLANK AND
THOMAS A. SNELLGROVE

[**Pinus monticola*] ✓

PACIFIC NORTHWEST FOREST AND RANGE EXPERIMENT STATION
U.S. DEPARTMENT OF AGRICULTURE FOREST SERVICE
PORTLAND, OREGON

ACKNOWLEDGMENTS

The recovery information presented in this report is the result of the cooperation of several organizations and a great many people. Loggers, truckers, scalers, foresters, and others made it possible to carry out this research.

Particular thanks is due the following organizations:

Idaho Forest Industries, Atlas Tie Division--for providing milling facilities and help from mill production personnel.

Region 1, U.S. Forest Service--for aid in planning the study and for personnel supplied during the milling operations.

Coeur d'Alene National Forest--personnel for fieldwork and milling operations.

Western Wood Products Association--for providing a grading supervisor.

ABSTRACT

A sample of 300 trees was selected to represent the full range in size and quality of commercial sawtimber available in northern Idaho. A net log scale of 167,900 board feet (Scribner) was sawn from 1,431 logs in a typical white pine mill, producing 212,703 board feet of lumber.

Lumber yields for each lumber grade are presented by log grade and diameter class. The study showed a recovery of 17 percent molding and selects; 5 percent No. 3 clear, No. 1 and 2 shop; and 78 percent commons.

Keywords: Log yield, western white pine, lumber, forest industries.

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INTRODUCTION

The United States contains an estimated 21 billion board feet of western white pine sawtimber.^{1/} Although western white pine ranges through the States of Idaho, Montana, Washington, Oregon, and California, about two-thirds of the board-foot volume is found in the area known as the "Inland Empire."^{2/} Approximately 93 percent of the western white pine lumber produced in the United States in 1970 was manufactured in this area.^{3/} For the years 1970-71, stumpage values for western white pine substantially exceeded the stumpage values of all other species in the Inland Empire.^{4/}

Since it is the most valuable species in this area, accurate valuation of this timber resource is important. Updated lumber recovery information for western white pine sawtimber is needed for better utilization and evaluation of the resource.

The lack of recent recovery information for evaluating western white pine sawtimber prompted a cooperative study between the Pacific Northwest Forest and Range Experiment Station, the Northern Region (Region 1) of the National Forest System, and the Idaho Forest Products Company. The purpose of the study was twofold--first, to obtain recovery information for appraisal purposes and, second, to provide information with which to improve or develop log or tree grading systems.

The specific purpose of this report is to present information on the type and volume of lumber that was produced under current industry manufacturing practices from a sample of the various grades and sizes of western white pine logs available to sawmills in northern Idaho. This information is most useful to timber appraisers, buyers, and processors, forest land managers, and forest inventory personnel.

^{1/} Information from most recent inventories of Forest Survey at the Pacific Northwest Forest and Range Experiment Station and the Intermountain Forest and Range Experiment Station.

^{2/} Inland Empire is northern Idaho, west slopes of the Rocky Mountains in Montana, and eastern Washington and Oregon.

^{3/} Western Wood Products Association 1970 Statistical Yearbook. WWPA Stat. Dep., 28 p., 1971.

^{4/} David R. Darr. Production, prices, employment, and trade in Northwest forest industries, fourth quarter 1971. USDA Forest Serv. Pac. Northwest Forest & Range Exp. Stn., 55 p., 1972.

STUDY PROCEDURES

Timber Sample

A sample of 300 trees was selected to represent the full range in size and quality of commercial sawtimber available in northern Idaho. However, two trees were not delivered to the mill; thus, this report is based on the remaining 298 sample trees. The trees were obtained from eight sample areas, shown in figure 1, on the Kaniksu, St. Joe, and Coeur d'Alene National Forests. The eight sample areas were chosen to represent differences in tree size, stem quality, and site characteristics. Within each sample area, individual trees were selected on the basis of d.b.h. to fulfill overall sample objectives. The total sample was not intended to be representative of the normal mix for any particular mill or specified time. Averages for some characteristics of the sample trees by area are shown in table 1.

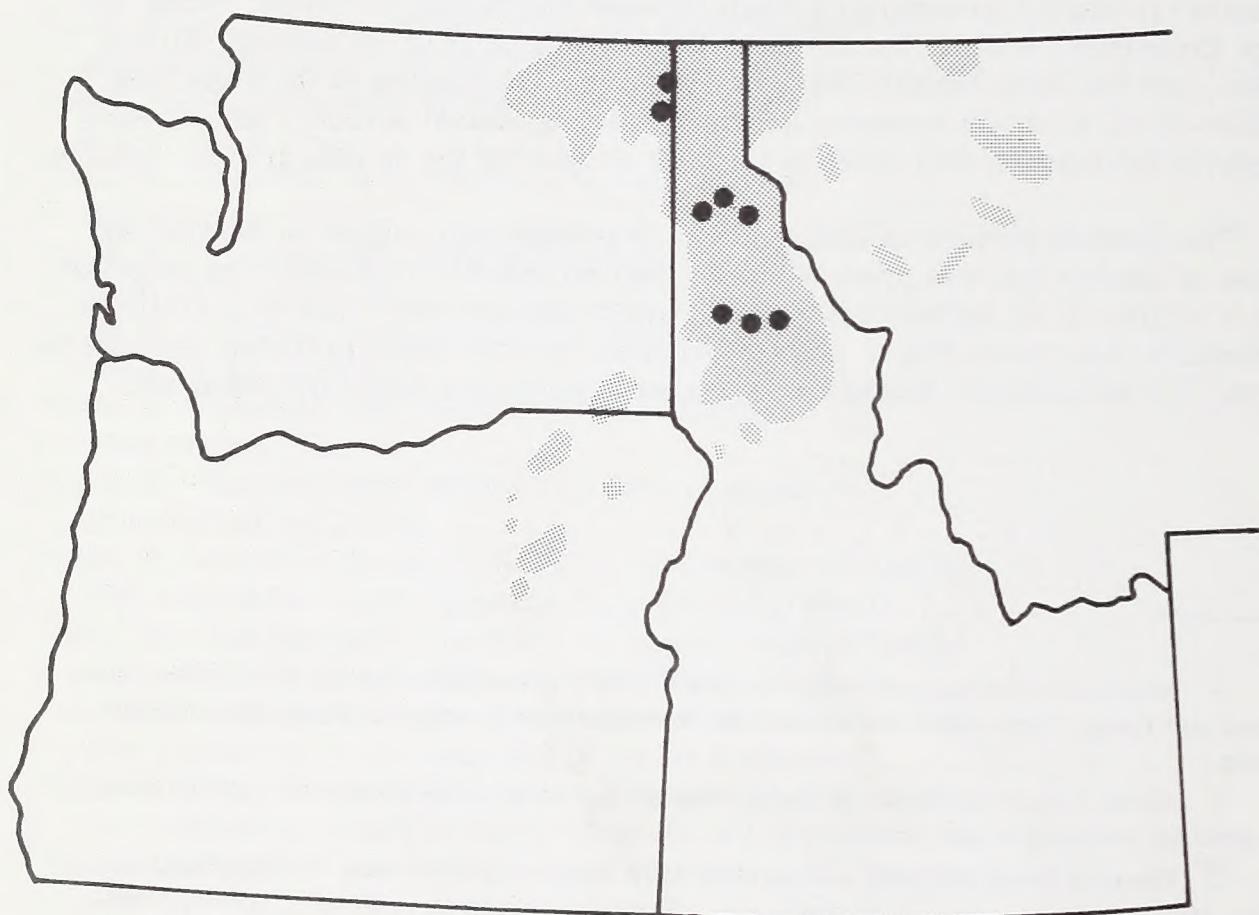


Figure 1.--Range of western white pine in the "Inland Empire" and general location of the eight areas from which study trees were cut.

Table 1.--Averages for some characteristics of study trees by sample areas

Characteristic	Sample area								Total
	1	2	3	4	5	6	7	8	
d.b.h. range (inches)	9.9-33.1	11.0-29.6	10.4-45.0	10.9-21.9	9.1-22.3	26.5-54.0	10.5-34.1	9.3-24.3	9.1-54-0
Average d.b.h. (inches)	14.4	23.5	20.9	17.1	13.3	38.4	21.9	15.2	19.2
Tree height range (feet)	60-125	83-173	71-200	80-144	81-125	144-215	71-179	84-137	60-215
Average tree height (feet)	94	142	126	114	102	184	142	109	120
Defect range (percent)	0-66	0-51	0-91	0-19	0-29	10-98	0-56	0-39	0-98
Average defect (percent)	9.2	10.9	18.6	7.8	4.0	40.5	13.8	4.4	12.8
Age range (years)	49-134	107-211	60-170	58-111	53-88	237-336	123-290	58-77	49-336
Average age (years)	74	176	93	84	66	299	213	66	117
Number of trees	70	25	54	20	40	26	27	36	298

LOGGING, IDENTIFICATION, AND DIAGRAMMING

The study trees were felled and bucked into saw logs by cooperating logging contractors according to normal industry practice. Each log was tagged in the woods to identify its origin with respect to tree and position in the tree.

The visible surface characteristics of each log were examined and recorded immediately after the trees were felled. Hence, the relationship of the external characteristics of a log to its lumber grades and yield could be analyzed to refine or develop log or tree grades. This record was also used to determine the grade^{5/} of the logs presented in this report.

TRANSPORTATION AND SCALING

The study logs were trucked to the cooperating mill for scaling and storage before sawing. The woods-length logs were scaled in the yard by the Western Wood Products Association and the U. S. Forest Service in accordance with the National Forest Service Log Scaling Handbook as of 1968. The logs were bucked in the yard and rescaled as mill-length logs according to the above rules. In this report, all log volumes are based on this scale.

The 298 sample trees produced 1,402 merchantable logs. The distribution of these logs plus the 29 cull logs by scaling diameter, length, and log grade is shown in tables 2 and 3.

Lumber Manufacturing

Sawing, drying, and surfacing practices of the mill were representative of general industry practice in that area. Log identity was maintained on each piece of lumber through the manufacturing process to the final point of grade and tally.

^{5/} Forest Survey Grades - U. S. Forest Service Form R1-2420-3.

Table 2.--Distribution of study logs by scaling diameter and log grade

Log diameter (inches)	Log grade					
	1	2	3	4	9	All grades
Number of logs						
4	0	0	1	0	0	1
5	0	0	4	1	0	5
6	0	0	26	14	0	40
7	0	0	60	55	0	115
8	0	1	46	80	0	127
9	0	0	29	113	0	142
10	0	1	30	108	0	139
11	0	3	12	104	0	119
12	0	3	10	96	1	110
13	0	2	6	85	1	94
14	0	2	4	77	0	83
15	0	1	2	65	0	68
16	0	2	1	47	1	51
17	0	1	0	49	3	53
18	0	1	0	31	2	34
19	0	5	1	26	3	35
20	0	4	2	23	2	31
21	1	5	0	24	1	31
22	0	2	0	16	2	20
23	1	4	0	9	1	15
24	0	2	0	11	1	14
25	0	5	1	11	0	17
26	0	1	1	7	2	11
27	0	4	0	4	1	9
28	1	4	0	6	1	12
29	1	4	0	3	2	10
30	0	2	0	2	2	6
31	0	7	0	2	1	10
32	0	4	0	1	0	5
33	0	2	0	5	0	7
34	0	2	0	0	1	3
35	0	2	0	2	0	4
36	0	3	1	1	1	6
37	0	0	0	0	0	0
38	0	0	0	1	0	1
39	1	1	0	0	0	2
40	0	0	0	0	0	0
41	0	1	0	0	0	1
42	0	0	0	0	0	0
Total	5	81	237	1,079	29	1,431

Table 3.--The distribution of study logs by length and grade

Length (feet)	Log grade					
	1	2	3	4	9	All grades
Number of logs						
8	0	0	8	10	0	18
10	0	0	18	24	1	43
12	0	5	43	121	2	171
14	1	2	10	53	2	77
16	4	72	142	831	23	1,072
18	0	2	7	27	0	36
20	0	0	1	13	0	14
Total	5	81	237	1,079	29	1,431

SAWING

The study logs were sawn under normal production conditions with the objective of obtaining the highest value from each log. Logs up to and including 20 feet in length were sawn. Lumber on the green chain did not exceed 16 feet because longer items were cut into two pieces. Shop items were sawn to 5/4-inch thickness and all other items to 4/4-inch.

Production equipment in the sawmill included a double-arbor edger and a 24-foot gang trimmer. A vertical band resaw located outside the mill was used to convert 8/4-inch-thick stock into 1-inch boards.

DRYING AND SURFACING

After the logs were sawn, all study lumber was kiln dried and surfaced according to general industry practices.

LUMBER GRADING AND TALLYING

A Western Wood Products Association grading inspector either graded or supervised the grading of study lumber on the planer chain. All study lumber was graded under the Western Wood Products Association, "Rules for Grading Western Lumber, July 1, 1968."

Each lumber item produced was placed in one of the following grades:

B and Better (Supreme)	No. 2 Shop
C Select (Choice)	No. 1 Common (Colonial)
D Select (Quality)	No. 2 Common (Sterling)
Molding	No. 3 Common (Standard)
No. 3 Clear	No. 4 Common (Utility)
No. 1 Shop	No. 5 Common (Industrial)

Each piece of lumber was tallied by its shipping dimensions and grade and by log number.

CUBIC VOLUME: LOGS, CHIPS, AND SAWDUST

In addition to lumber grade and board-foot volume data collected, the cubic volume of logs, lumber, residues, and sawdust was calculated for all study logs.

The gross cubic-foot log volume was computed by the following formula:

$$V = \frac{\pi L (D_s^2 + D_s D_e + D_e^2)}{4 \times 3 \times 144}$$

where

V = Gross cubic-foot log volume

D_s = Diameter in inches of small end of log

D_e = Diameter in inches of large end of log

L = Log length in feet

The lumber cubic volumes, shown in tables 5-10 of the appendix, are based on actual dimensions of the surfaced dry lumber taken from the planer settings at the time of the study.

The sawdust cubic volumes, also shown in tables 5-10 of the appendix, were calculated by using an average saw kerf of 0.25 inch and the computed surface area of the rough green lumber from each log.

The combined volumetric shrinkage plus the cubic volume of planer shavings was calculated by subtracting the cubic volume of surfaced dry lumber from the cubic volume of rough green lumber.

The residue volume was calculated by subtracting the lumber, sawdust, volumetric shrinkage, and planer shaving volumes from the gross cubic log volume. It includes a small amount of sawdust produced from the production of slabs, edging, and trim ends.

RESULTS

The 1,402 merchantable logs produced 203,053 board feet of lumber. The average weighted recovery of merchantable logs was 122 percent. A significant linear relationship was found between percent recovery and diameter (see fig. 2). As expected, percent recovery decreased with an increase in diameter.

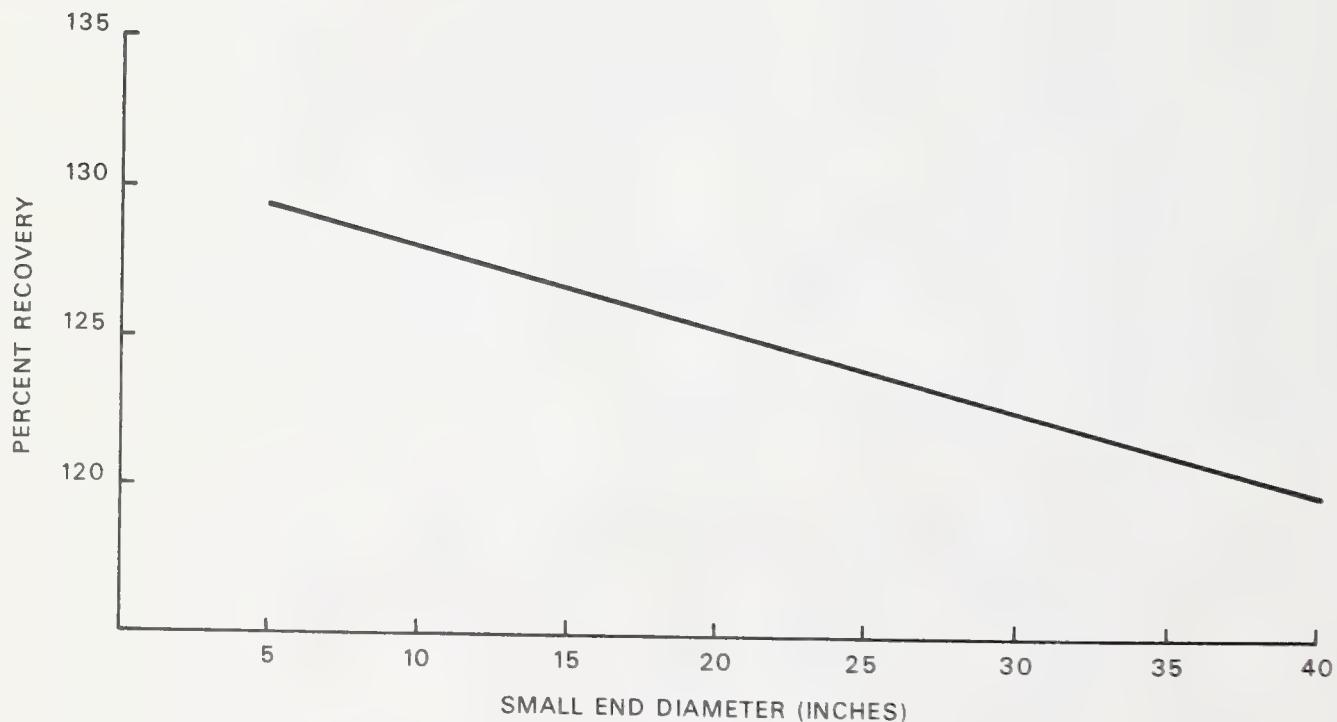


Figure 2.--Percent recovery of all merchantable logs over log scaling diameter.

Detailed lumber yield, chippable residue, and sawdust volume information according to log size and log grade are shown in the appendix (tables 4 through 22). Lumber volume from the study is summarized by thickness, width, and grade in table 4. Eighty-five percent of the lumber volume produced was in 1-inch boards, and 5/4-inch shop items accounted for the remainder of the lumber production. The average lumber grade yield for each log grade is shown in figure 3.

The log scale, lumber tally, and cubic volumes obtained for each log are summarized by scaling diameter and log grade in tables 5 through 10.

The lumber grade yields, by scaling diameter and log grade, are shown in tables 11 through 16. Tables 17 through 22 show lumber grade recovery as a percentage of lumber tally volume by 1-inch diameter class and log grade. Curves of that lumber grade recovery are shown in figures 4, 5, and 6. Because of insufficient data at the extremes, the curves were not extended through the entire diameter range of the logs.

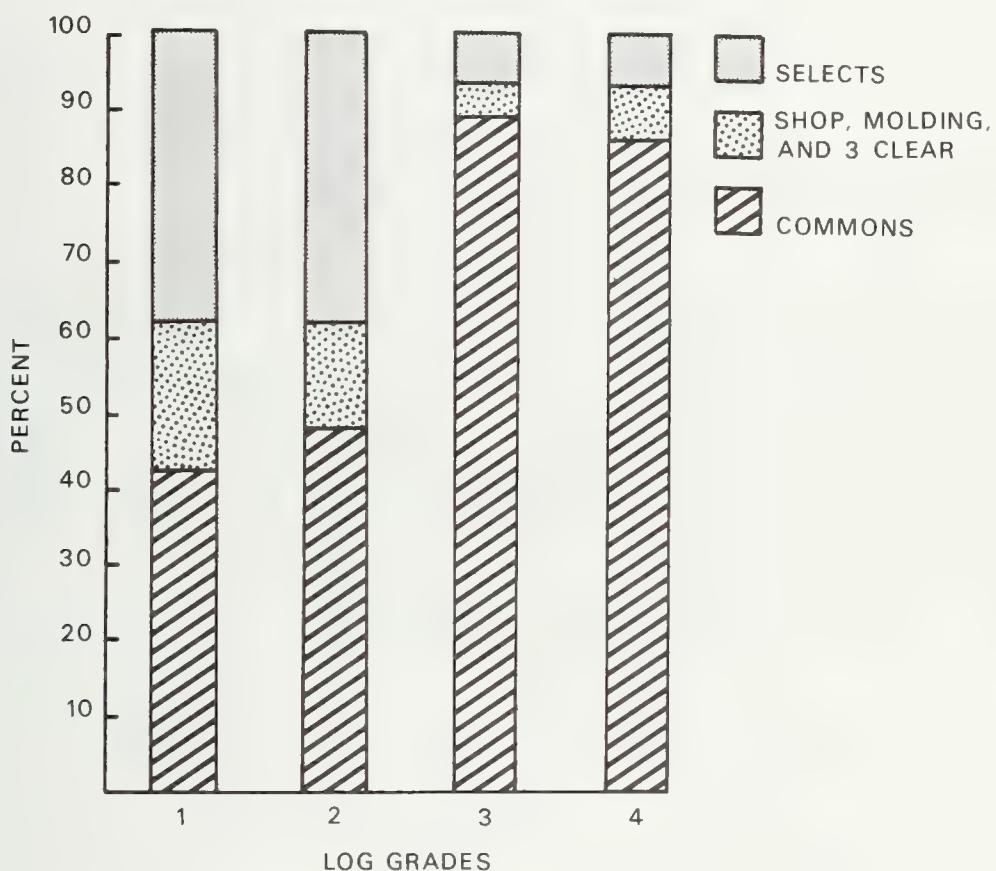


Figure 3.--Lumber grade yield expressed as a percent of the total volume for each log grade. (Includes 29 cull logs.)

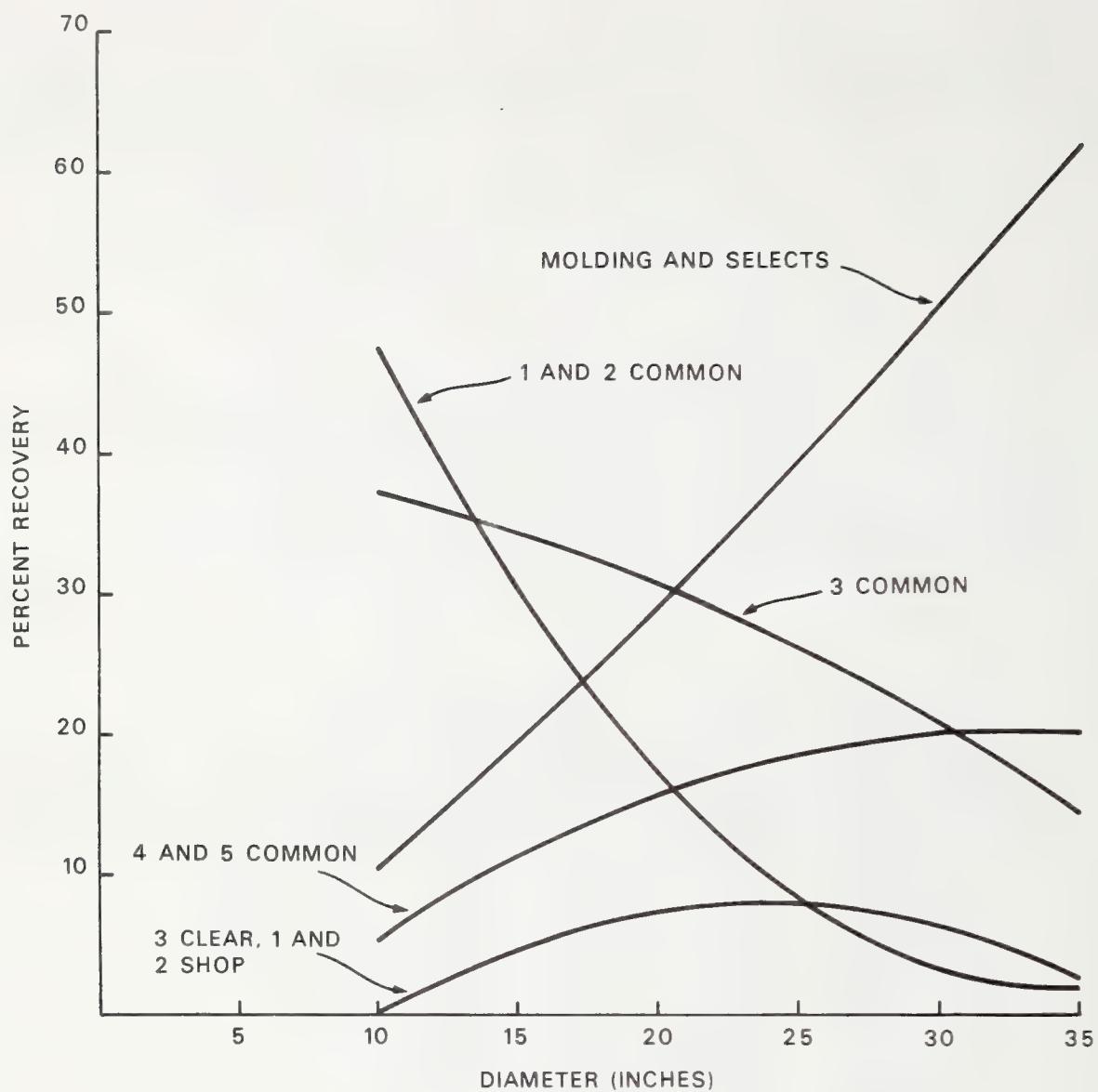


Figure 4.--Lumber recovery expressed as a percent of lumber tally volume over diameter--log grade 2.

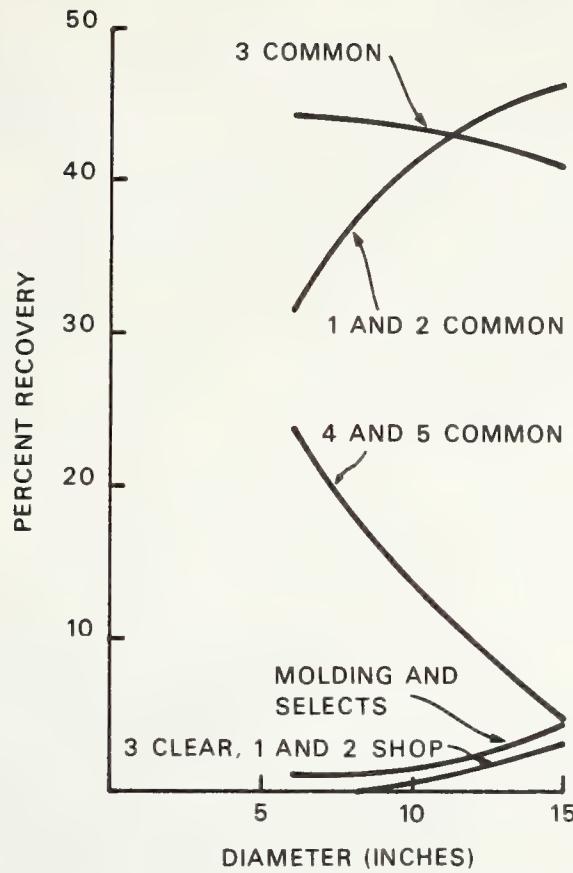


Figure 5.--Lumber recovery expressed as a percent of lumber tally volume over diameter--log grade 3.

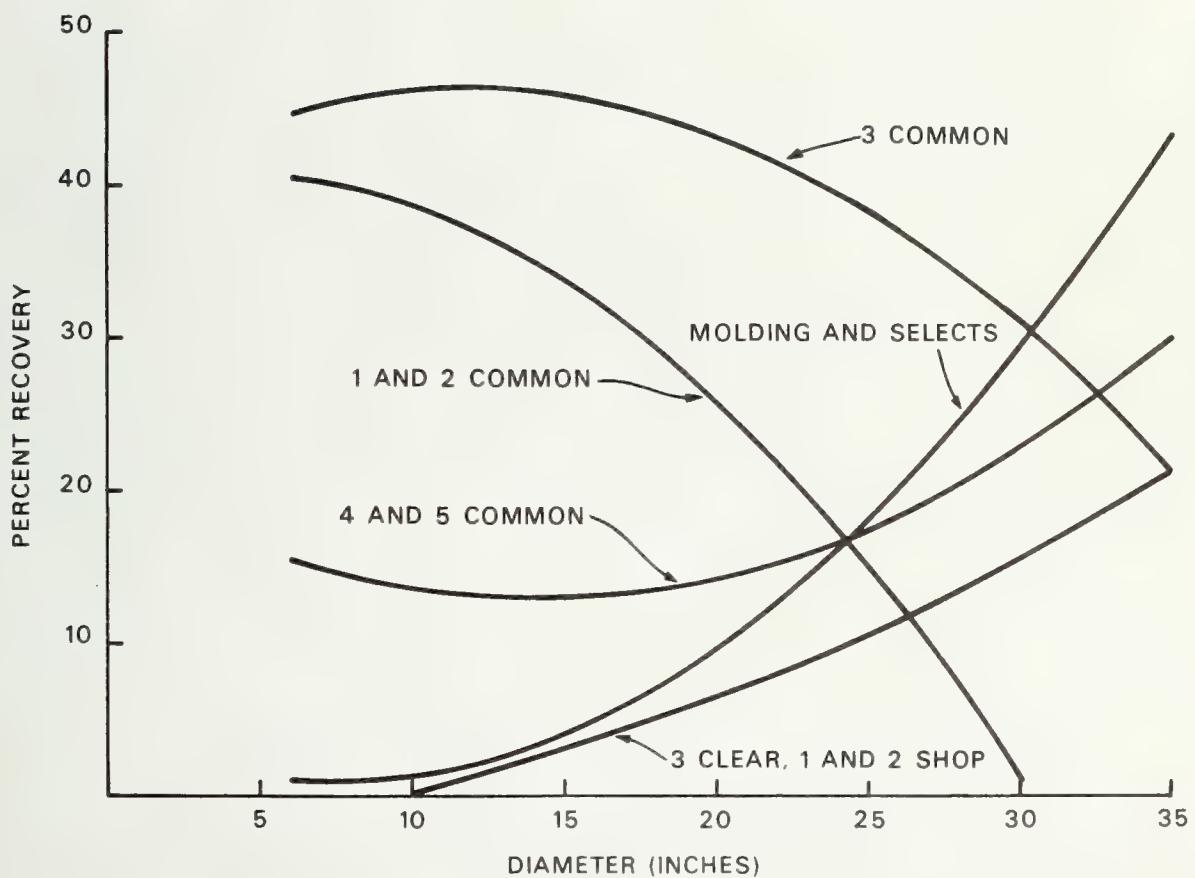


Figure 6.--Lumber recovery expressed as a percent of lumber tally volume over diameter--log grade 4.

APPENDIX

TABLES OF LUMBER RECOVERY DATA BY DIAMETER AND LOG GRADE

Table 4.--Percent of lumber tally by thickness, width, and lumber grade^{1/}

Width (inches)	Volume	Lumber grade										Total
		B & Btr. Select	C Select	D Select	Molding	No. 3 Clear	No. 1 Shop	No. 2 Shop	No. 1 Common	No. 2 Common	No. 3 Common	No. 4 Common
<i>Board feet</i>												
1 inch thick:												
4	12,121	0.08	0.33	0.59	0.30	0	0	0.08	0.97	2.15	0.97	0.23
6	47,605	.26	.99	1.90	.51	.13	.35	.26	.20	2.90	7.26	4.64
8	31,759	.05	.41	.56	.29	.17	.23	.15	.20	4.87	6.52	1.41
10	25,453	.09	.29	.79	.25	.56	.58	.29	.16	3.41	4.52	1.00
12	63,814	.20	.77	1.81	.83	1.07	1.02	.51	.55	5.83	13.23	4.08
Total	180,752	.68	2.79	5.65	2.18	1.93	2.18	1.21	1.19	17.98	33.68	12.10
1-1/4 (5/4) inches thick:												
4	2,044	.10	.23	.13	.15	(2/)	(2/)	(2/)	(2/)	.02	.17	.10
6	5,152	.16	.30	.27	.04	(2/)	(2/)	(2/)	(2/)	.06	.79	.64
8	4,636	.07	.19	.13	.02	(2/)	(2/)	(2/)	(2/)	.05	.76	.56
10	6,222	.12	.25	.45	.27	(2/)	(2/)	(2/)	(2/)	.04	.66	.66
12	13,897	.37	.81	1.07	.43	(2/)	(2/)	(2/)	(2/)	.03	1.05	1.97
Total	31,951	.82	1.78	2.05	.91	(2/)	(2/)	(2/)	(2/)	.20	3.43	3.93
Total	212,703	1.50	4.57	7.70	3.09	1.93	2.18	1.21	1.39	21.41	37.61	13.95

^{1/} Includes 29 cul logs.^{2/} The cooperating mill chose not to produce any of these items for this study.

Table 5.--Log scale, lumber tally, and cubic volumes by scaling diameter for grade 1 logs

Log scaling diameter (inches)	Number of logs	Log scale			Lumber tally			Cubic volume		
		Gross	Net	Volume	Recovery ratio	Log	Surface dry lumber	Lumber recovery ratio	Green sawdust	Volumetric shrinkage and planer shavings
21	1	300	190	227	119	58.77	13.91	24	5.48	6.06
22	0	--	--	--	--	--	--	--	--	--
23	1	350	405	116	51.24	26.82	52	8.98	10.03	5.41
24	0	--	--	--	--	--	--	--	--	--
25	0	--	--	--	--	--	--	--	--	--
26	0	--	--	--	--	--	--	--	--	--
27	0	--	--	--	--	--	--	--	--	--
28	1	510	300	435	145	64.69	26.21	41	10.74	12.14
29	1	610	560	615	110	80.53	39.66	49	14.17	15.92
30	0	--	--	--	--	--	--	--	--	--
31	0	--	--	--	--	--	--	--	--	--
32	0	--	--	--	--	--	--	--	--	--
33	0	--	--	--	--	--	--	--	--	--
34	0	--	--	--	--	--	--	--	--	--
35	0	--	--	--	--	--	--	--	--	--
36	0	--	--	--	--	--	--	--	--	--
37	0	--	--	--	--	--	--	--	--	--
38	0	--	--	--	--	--	--	--	--	--
39	1	1,120	730	860	118	149.47	56.66	38	19.43	20.65
Total	5	2,920	2,130	2,542	119	404.70	163.26	40	58.80	64.80
									117.84	

Table 6.--Log scale, lumber tally, and cubic volumes by scaling diameter for grade 2 logs

Log scaling diameter (inches)	Number of logs	Log scale			Lumber tally			Cubic volume			
		Gross	Net	Volume	Recovery ratio	Log	Surface dry lumber	Lumber recovery ratio	Green sawdust	Volumetric shrinkage and planer shavings	
8	30	30	30	39	130	6.51	2.33	36	1.01	1.09	
9	--	--	--	--	--	--	--	--	--	--	
10	60	62	124	13.82	3.66	26	1.52	1.69	6.95	6.95	
11	210	200	107	48.83	13.40	27	5.12	5.61	24.70	24.70	
12	240	220	144	58.12	19.31	33	7.77	8.58	22.46	22.46	
13	200	150	207	138	45.54	12.75	28	5.02	5.63	22.14	
14	220	140	259	185	40.80	15.94	39	6.29	6.93	11.64	
15	140	140	170	121	21.76	10.74	49	3.89	4.30	2.83	
16	320	310	350	113	62.94	22.42	36	8.10	9.19	23.23	
17	180	180	223	124	27.57	14.24	52	5.24	5.98	2.11	
18	210	180	165	92	52.60	9.90	19	4.19	4.52	33.99	
19	1,200	1,050	1,359	129	234.20	84.66	36	32.44	36.93	80.17	
20	4	1,080	1,199	111	164.75	77.33	47	27.42	31.15	28.85	
21	5	1,500	1,360	1,629	120	246.84	103.23	42	38.30	43.80	61.51
22	2	660	640	752	117	108.96	47.64	44	17.70	20.26	23.36
23	4	1,520	1,220	1,675	137	241.37	107.24	44	38.89	44.07	51.17
24	2	800	750	905	121	138.69	58.05	42	20.95	23.61	36.08
25	5	2,240	1,750	2,050	117	349.74	130.74	37	47.70	53.55	117.75
26	1	560	560	587	105	73.99	37.86	51	13.57	15.17	7.39
27	4	2,060	1,500	1,684	112	289.81	108.70	37	38.91	43.00	99.20
28	4	2,180	1,540	2,009	130	302.46	127.95	42	47.04	52.61	74.86
29	4	2,290	2,020	2,191	108	300.64	140.00	47	51.23	57.50	51.91
30	2	1,150	840	1,085	129	151.52	71.00	47	24.68	26.96	28.88
31	7	4,790	3,010	4,614	153	726.70	289.93	40	109.26	122.02	205.49
32	4	3,050	2,330	3,079	132	453.50	197.65	44	71.69	79.54	104.62
33	2	1,560	1,300	1,737	134	217.61	114.88	53	39.11	42.97	20.65
34	2	1,600	1,400	1,598	114	219.87	102.11	46	37.30	41.57	38.89
35	2	1,760	1,600	1,803	113	323.46	116.13	36	41.66	46.24	119.43
36	3	2,760	1,690	2,591	153	491.88	161.36	33	62.19	68.92	199.41
37	0	--	--	--	--	--	--	--	--	--	--
38	0	--	--	--	--	--	--	--	--	--	--
39	1	1,120	1,100	1,195	109	147.68	78.29	53	27.12	29.85	12.42
40	0	--	--	--	--	--	--	--	--	--	--
41	1	1,270	1,120	1,176	105	232.12	78.95	34	25.99	27.98	99.20
Total	81	36,960	29,460	36,924	125	5,794.28	2,358.39	41	861.30	961.22	1,613.37

Table 7.--Log scale, lumber tally, and cubic volumes by scaling diameter for grade 3 logs

Log scaling diameter (inches)	Number of logs	Log scale			Lumber tally			Cubic volume		
		Gross	Net	Volume	Recovery ratio	Log	Surface dry lumber	Lumber recovery ratio	Green sawdust	Volumetric shrinkage and planer shavings
4	1	10	10	14	140	3.42	0.79	23	0.35	0.36
5	4	40	40	61	152	14.53	3.63	25	1.57	1.59
6	26	400	350	489	140	109.48	29.04	27	12.65	13.16
7	60	1,420	1,400	1,657	118	309.67	99.34	32	42.18	45.36
8	46	1,190	1,180	1,594	135	301.01	97.30	32	39.10	42.27
9	29	1,040	1,010	1,287	127	228.44	79.41	35	31.33	34.31
10	30	1,560	1,550	1,897	122	304.35	118.49	39	45.47	50.14
11	12	750	740	915	124	144.92	57.10	39	22.04	24.33
12	10	750	750	955	127	143.95	59.61	41	22.77	25.20
13	6	580	560	720	129	116.76	44.73	38	17.24	19.30
14	4	440	440	577	131	78.72	36.70	47	13.47	14.99
15	2	250	250	293	117	40.55	18.36	45	7.04	7.94
16	1	160	150	204	136	24.66	12.98	53	4.71	5.37
17	0	--	--	--	--	--	--	--	--	--
18	0	--	--	--	--	--	--	--	--	--
19	1	240	240	292	122	35.81	18.67	52	6.76	7.70
20	2	560	500	598	120	81.88	37.86	46	14.09	16.07
21	0	--	--	--	--	--	--	--	--	--
22	0	--	--	--	--	--	--	--	--	--
23	0	--	--	--	--	--	--	--	--	--
24	0	--	--	--	--	--	--	--	--	--
25	1	340	310	360	116	44.69	23.12	52	8.37	9.50
26	1	500	470	501	107	65.64	31.96	49	11.63	13.31
27	0	--	--	--	--	--	--	--	--	--
28	0	--	--	--	--	--	--	--	--	--
29	0	--	--	--	--	--	--	--	--	--
30	0	--	--	--	--	--	--	--	--	--
31	0	--	--	--	--	--	--	--	--	--
32	0	--	--	--	--	--	--	--	--	--
33	0	--	--	--	--	--	--	--	--	--
34	0	--	--	--	--	--	--	--	--	--
35	0	920	850	1,017	120	126.62	67.45	53	22.80	24.70
36	1	--	--	--	--	--	--	--	--	11.67
Total	237	11,150	10,800	13,431	124	2,175.10	836.54	38	323.57	355.60
										659.39

Table 8.—Log scale, lumber tally, and cubic volumes by scaling diameter for grade 4 logs.

Table 9.--Log scale, lumber tally, and cubic volumes by scaling diameter for grade 9 logs

Log scaling diameter (inches)	Number of logs	Log scale			Lumber tally			Cubic volume		
		Gross	Net	Volume	Recovery ratio	Log	Surface dry lumber	Lumber recovery ratio	Green sawdust	Volumetric shrinkage and planer shavings
12	1	80	20	63	315	17.97	3.82	21	1.59	1.77
13	1	100	0	123	---	16.51	7.46	45	3.02	3.40
14	0	---	---	---	---	---	---	---	---	---
15	1	120	30	132	440	18.86	8.13	43	3.22	3.68
16	1	540	90	553	614	88.63	33.21	37	13.74	15.44
17	3	420	0	493	---	81.95	29.94	37	12.11	13.68
18	2	720	120	605	504	118.70	37.20	31	14.80	16.79
19	3	450	70	406	580	66.22	24.93	37	10.15	11.35
20	2	300	80	230	288	51.79	13.86	27	5.67	6.41
21	1	660	120	631	526	111.24	38.26	34	15.48	17.60
22	2	380	0	347	---	47.61	20.86	44	8.67	9.72
23	1	400	0	323	---	60.22	19.25	32	8.13	9.03
24	1	---	---	---	---	---	---	---	---	---
25	0	1,000	0	860	---	128.45	52.20	41	21.14	23.87
26	2	550	0	435	---	88.02	26.03	30	10.93	12.19
27	1	580	140	378	270	76.17	22.68	30	9.44	10.60
28	1	1,140	260	902	347	172.73	54.94	32	22.13	24.78
29	2	1,140	320	1,084	339	154.68	66.84	43	26.21	29.42
30	2	530	0	392	---	69.28	24.31	35	9.45	10.46
31	1	32	0	---	---	---	---	---	---	---
32	0	---	---	---	---	---	---	---	---	---
33	0	---	---	---	---	---	---	---	---	---
34	1	800	200	656	328	114.86	39.39	34	16.38	18.39
35	0	---	---	1,037	---	---	---	---	---	---
36	1	920	0	1,037	---	164.67	63.20	38	25.46	28.76
Total	29	10,830	1,450	9,650	666	1,648.56	585.97	36	237.72	267.34
										557.53

Table 10.--Log scale, lumber tally, and cubic volumes by scaling diameter for all log grades

Table 11.--Lumber tally volume by 1-inch diameter class for log grade 1

Log scaling diameter (inches)	Number of logs	Total lumber tally volume	Board feet				Volume by grade							
			B & Btr. Select	C Select	D Select	Molding	No. 3 Clear	No. 1 Shop	No. 2 Shop	No. 1 Common	No. 2 Common	No. 3 Common	No. 4 Common	No. 5 Common
21	1	227	10	70	10	44	0	0	0	8	8	19	50	--
22	0	--	--	--	--	--	--	--	--	--	--	--	--	--
23	1	405	0	42	61	32	11	0	0	45	104	90	20	0
24	0	--	--	--	--	--	--	--	--	--	--	--	--	--
25	0	--	--	--	--	--	--	--	--	--	--	--	--	--
26	0	--	--	--	--	--	--	--	--	--	--	--	--	--
27	0	--	--	--	--	--	--	--	--	--	--	--	--	--
28	1	435	6	5	43	0	26	28	32	0	0	93	133	69
29	1	615	0	42	90	74	48	30	48	0	4	74	205	0
30	0	--	--	--	--	--	--	--	--	--	--	--	--	--
31	0	--	--	--	--	--	--	--	--	--	--	--	--	--
32	0	--	--	--	--	--	--	--	--	--	--	--	--	--
33	0	--	--	--	--	--	--	--	--	--	--	--	--	--
34	0	--	--	--	--	--	--	--	--	--	--	--	--	--
35	0	--	--	--	--	--	--	--	--	--	--	--	--	--
36	0	--	--	--	--	--	--	--	--	--	--	--	--	--
37	0	--	--	--	--	--	--	--	--	--	--	--	--	--
38	0	--	--	--	--	--	--	--	--	--	--	--	--	--
39	1	860	92	276	239	115	0	16	0	11	0	40	27	44
Total	5	2,542	108	435	443	265	85	74	80	64	116	305	404	163

Table 12.--Lumber tally volume by 1-inch diameter class for log grade 2

Log scaling diameter (inches)	Number of logs	Total lumber tally volume	Board feet				Volume by grade							
			B & Btr. Select	C Select	D Select	Molding	No. 3 Clear	No. 1 Shop	No. 2 Shop	No. 1 Common	No. 2 Common	No. 3 Common	No. 4 Common	No. 5 Common
8	1	39	0	7	0	0	0	0	0	0	0	7	20	5
9	0	--	--	--	--	--	--	--	--	--	--	--	--	0
10	1	62	0	4	0	0	0	0	0	0	34	24	0	0
11	3	215	0	3	6	3	0	0	0	5	121	77	0	0
12	3	316	12	0	46	5	0	0	0	8	121	105	15	4
13	2	207	0	12	24	0	0	0	0	0	79	68	24	0
14	2	259	0	0	18	0	0	0	0	0	65	100	40	28
15	1	170	21	13	23	0	0	0	0	0	8	55	50	0
16	2	350	6	18	38	0	0	0	0	0	56	128	29	48
17	1	223	3	5	31	0	10	13	0	0	0	0	145	16
18	1	165	5	36	36	4	0	0	0	0	0	0	31	19
19	5	1,359	13	157	191	13	81	40	37	0	120	405	251	51
20	4	1,199	5	130	194	55	62	25	0	46	206	402	68	6
21	5	1,629	32	139	221	37	111	75	0	0	344	484	176	10
22	2	752	0	30	171	52	16	0	0	0	126	337	15	5
23	4	1,675	12	53	325	134	107	22	62	42	169	551	170	28
24	2	905	4	73	95	98	64	117	5	6	109	210	98	26
25	5	2,050	99	250	302	112	77	23	39	46	48	620	298	136
26	1	587	12	113	96	42	20	64	0	0	34	126	67	13
27	4	1,684	110	279	261	218	12	12	0	0	84	372	188	148
28	4	2,009	168	293	270	267	32	57	6	0	73	468	292	83
29	4	2,191	161	220	351	334	123	96	16	7	50	358	369	106
30	2	1,085	111	276	131	110	8	12	0	0	7	134	181	115
31	7	4,614	107	643	1,066	417	0	8	48	22	115	1,024	682	482
32	4	3,079	72	448	946	245	53	46	16	6	120	418	497	212
33	2	1,737	232	456	337	237	48	47	0	0	5	161	152	62
34	2	1,598	123	261	251	121	0	16	16	0	76	445	239	50
35	2	1,803	6	352	535	202	0	16	0	0	56	327	181	128
36	3	2,591	70	416	605	433	12	90	22	0	19	243	310	371
37	0	--	--	--	--	--	--	--	--	--	--	--	--	--
38	0	--	--	--	--	--	--	--	--	--	--	--	--	--
39	1	1,195	216	271	138	0	0	16	0	0	98	141	89	12
40	0	--	--	--	--	--	--	0	0	7	25	67	37	55
41	1	1,176	87	519	234	145	0	0	0	0	0	0	0	0
Total	81	36,924	1,687	5,473	7,022	3,422	836	787	283	259	2,494	7,942	4,542	2,177

Table 13.-Lumber tally volume by 1-inch diameter class for log grade 3

Log scaling diameter (inches)	Number of logs	Total lumber tally volume	B & Btr. Select	C Select	D Select	Molding	No. 3 Clear	No. 1 Shop	No. 2 Shop	No. 1 Common	No. 2 Common	No. 3 Common	No. 4 Common	No. 5 Common		
4	1	14	0	0	0	0	0	0	0	0	0	0	0	3	0	
5	4	61	0	0	0	0	0	0	0	0	0	0	20	16	6	
6	26	489	0	0	2	0	0	0	0	0	0	6	158	202	27	
7	60	1,657	0	16	7	6	0	0	0	0	0	15	512	779	22	
8	46	1,594	0	0	3	0	0	0	0	0	0	34	479	773	16	
9	29	1,287	0	0	0	0	0	0	0	0	0	52	483	549	10	
10	30	1,897	0	0	10	0	0	0	0	0	0	70	903	725	0	
11	12	915	5	0	21	0	0	0	0	0	0	4	321	469	0	
12	10	955	0	0	4	0	0	0	0	0	0	5	449	406	0	
13	6	720	8	34	13	0	0	0	0	0	0	36	354	192	0	
14	4	577	0	0	5	0	0	0	0	0	0	9	280	208	11	
15	2	293	0	0	3	5	0	0	0	0	0	13	156	78	0	
16	1	204	0	0	30	0	0	0	0	0	0	0	0	125	0	
17	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
18	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
19	1	292	0	6	26	27	37	0	0	0	0	14	48	92	0	
20	2	598	0	2	12	0	67	13	7	0	0	0	104	372	4	
21	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
22	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
23	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
24	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
25	1	360	10	17	57	0	36	10	12	29	29	44	115	30	0	
26	1	501	8	10	64	60	97	29	0	0	0	53	108	72	0	
27	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
28	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
29	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
30	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
31	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
32	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
33	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
34	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
35	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
36	1	1,017	145	150	181	87	123	8	0	0	0	0	32	175	112	4
Total	237	13,431	176	235	438	185	373	60	19	287	4,412	5,387	1,759	100		

Table 14.--Lumber tally volume by 1-inch diameter class for log grade 4

Log scaling diameter (inches)	Number of logs	Total lumber tally volume	B & Btr. Select	Board feet			Volume by grade							
				C Select	D Select	Molding	No. 3 Clear	No. 1 Shop	No. 2 Shop	No. 1 Common	No. 2 Common	No. 3 Common	No. 4 Common	No. 5 Common
5	1	16	0	0	0	0	0	0	0	0	3	9	4	0
5	14	265	0	0	3	0	0	0	0	0	7	124	86	43
6	55	1,637	5	5	5	0	0	0	0	0	16	547	779	247
7	80	2,964	0	17	11	14	7	0	0	0	82	877	1,428	469
8	113	5,396	0	6	39	20	0	0	0	0	95	1,827	2,623	749
9	108	6,649	10	3	63	0	4	0	0	0	70	2,600	3,195	636
10	104	8,660	6	19	86	22	8	0	0	0	343	3,507	3,708	905
11	96	9,401	5	26	152	8	0	0	0	0	49	202	3,870	3,976
12	85	9,726	13	71	203	30	0	0	0	0	21	34	207	3,550
13	85	10,200	4	63	162	31	0	0	0	0	17	3	178	3,684
14	77	10,272	12	89	208	77	48	68	42	42	100	3,427	4,783	1,312
15	65	8,580	3	80	158	29	13	47	62	62	151	2,861	4,224	862
16	47	10,197	66	213	394	124	82	162	174	174	265	2,854	4,836	918
17	49	7,550	56	136	341	54	118	121	140	140	128	1,759	3,609	1,027
18	31	6,450	0	89	213	73	101	354	164	164	136	1,371	3,064	837
19	26	6,616	12	136	322	72	130	347	186	186	58	1,186	2,946	1,134
20	23	7,459	38	203	443	96	351	348	191	191	104	1,398	3,054	1,108
21	24	5,464	23	201	456	169	145	387	144	144	16	702	2,067	1,065
22	16	3,160	18	30	219	27	188	235	85	85	56	324	1,622	344
23	9	4,602	39	163	426	110	168	191	138	138	30	294	2,234	712
24	11	4,366	87	218	442	172	181	107	91	91	24	318	1,454	932
25	11	3,197	82	148	435	213	186	192	92	92	36	262	1,015	496
26	7	1,598	102	163	336	31	37	54	43	43	0	98	394	292
27	4	3,477	123	175	343	187	144	134	137	137	0	266	1,107	692
28	6	3,702	73	296	547	238	289	158	61	61	0	114	1,029	582
29	3	1,690	68	106	381	75	107	158	44	44	0	153	305	279
30	2	1,215	8	49	69	33	137	113	55	55	0	13	412	258
31	2	1,177	25	105	255	60	38	27	64	64	12	73	282	156
32	1	660	45	77	186	46	29	8	24	24	30	65	124	21
33	5	3,702	73	296	547	238	289	158	61	61	0	114	1,029	582
34	0	1,817	40	119	300	140	86	68	32	32	0	60	465	381
35	2	933	58	68	185	96	59	83	0	0	0	54	252	69
36	1	0	--	--	--	--	--	--	--	--	--	--	--	--
37	0	1,060	91	69	228	95	56	104	32	32	0	5	157	203
38	1													20
Total	1,079	150,156	1,112	3,143	7,522	2,436	2,708	3,508	2,087	2,349	38,252	64,162	20,384	2,493

Table 15.--Lumber tally volume by 1-inch diameter class for log grade 9

Log scaling diameter (inches)	Number of logs	Total lumber tally volume	B & Btr. Select	C Select			Molding	No. 3 Clear	Volume by grade			No. 4 Common	No. 5 Common
				D Select	Molding	No. 1 Shop			No. 2 Shop	No. 1 Common	No. 2 Common		
12	1	63	0	0	0	0	0	0	0	0	0	31	12
13	1	123	0	0	0	0	0	0	0	0	8	115	0
14	0	--	--	--	--	--	--	--	--	--	--	--	--
15	0	132	0	0	0	0	0	0	0	0	0	24	108
16	1	553	0	6	4	0	0	0	0	6	0	162	0
17	3	493	0	53	43	8	0	0	0	0	4	283	88
18	2	605	7	0	27	13	0	0	0	5	46	98	154
19	3	406	0	13	7	0	0	0	0	13	0	271	109
20	2	230	0	0	0	0	0	0	0	0	15	59	130
21	1	631	0	10	32	11	0	0	0	0	0	0	71
22	2	347	0	0	16	0	0	0	0	0	0	12	277
23	1	323	0	0	22	0	0	0	0	0	0	0	155
24	1	0	--	--	--	--	--	--	--	--	--	25	134
25	0	860	28	51	80	100	37	17	8	0	0	54	107
26	2	435	0	3	24	0	0	0	0	0	0	40	145
27	1	378	0	14	38	0	0	0	0	0	0	0	170
28	1	902	19	78	105	52	8	37	12	0	0	19	220
29	2	1,084	34	72	213	44	17	105	33	0	0	0	178
30	1	392	10	61	43	8	0	12	17	0	5	109	157
31	1	0	--	--	--	--	--	--	--	--	--	72	49
32	0	0	--	--	--	--	--	--	--	--	--	--	--
33	0	656	0	83	85	18	32	0	0	0	0	31	123
34	1	0	--	--	--	--	--	--	--	--	--	--	284
35	0	1,037	0	28	179	43	0	0	0	0	0	0	305
36	1	0	--	--	--	--	--	--	--	--	--	0	176
Total	29	9,650	98	472	918	297	94	199	104	5	273	2,172	2,580
													2,438

Table 16.--Lumber tally volume by 1-inch diameter class for all log grades

Log scaling diameter (inches)	Number of logs	Total lumber tally volume	B & Btr. Select	C Select	D Select	Molding	No. 3 Clear	No. 1 Shop	No. 2 Shop	No. 1 Common	No. 2 Common	No. 3 Common	No. 4 Common	No. 5 Common
Board feet														
4	14	0	0	0	0	0	0	0	0	0	0	0	3	11
5	77	0	0	0	0	0	0	0	0	0	0	0	20	19
6	754	0	0	5	0	0	0	0	0	0	0	0	282	137
7	3,294	5	21	12	11	0	0	0	0	0	0	0	1,059	1,558
8	4,597	0	24	14	14	0	0	0	0	0	0	0	2,221	547
9	6,683	0	6	39	20	0	0	0	0	0	0	0	1,363	763
10	8,608	10	3	77	0	0	4	0	0	0	0	0	2,310	942
11	9,790	11	22	113	25	8	0	0	0	0	0	0	3,537	825
12	10,735	17	26	202	13	0	0	0	0	0	0	0	3,949	825
13	10,776	21	117	240	30	0	0	0	0	0	0	0	4,254	1,000
14	11,036	4	63	185	31	0	0	0	0	0	0	0	4,440	4,518
15	83	33	102	234	82	61	76	42	42	113	113	1,189	1,189	66
16	68	9	98	226	29	13	47	62	62	207	207	1,416	1,416	75
17	51	9	224	429	124	92	175	180	180	265	265	3,991	4,588	107
18	34	61	225	420	66	118	121	140	140	133	133	3,726	3,726	107
19	35	8,706	20	252	457	126	219	394	214	150	150	5,023	5,023	107
20	31	8,819	17	281	535	127	259	400	193	104	104	3,638	3,638	106
21	31	9,545	80	412	674	177	462	423	206	112	112	3,005	4,402	1,051
22	20	23	241	659	232	161	387	144	144	16	16	2,858	5,143	1,217
23	15	5,587	30	125	621	193	306	270	147	143	143	597	2,288	1,235
24	14	5,830	43	236	543	208	232	308	143	36	36	406	2,500	1,235
25	17	6,776	196	485	801	284	294	140	142	99	99	410	2,189	1,235
26	11	5,145	130	322	675	415	340	302	100	36	36	403	1,419	1,235
27	9	3,717	212	445	621	249	49	66	43	0	0	182	806	587
28	12	6,299	297	487	694	454	202	219	175	0	0	339	1,687	1,204
29	10	5,398	43	248	446	927	535	286	321	120	7	207	915	1,096
30	6	3,384	153	397	413	187	162	230	88	0	0	20	655	739
31	10	6,183	142	809	1,364	485	38	47	129	34	34	193	1,378	887
32	5	3,739	117	525	1,132	291	82	54	40	36	36	185	542	518
33	7	5,439	305	752	884	475	337	205	61	0	0	119	1,190	734
34	3	2,254	123	344	336	139	32	16	16	0	0	76	476	362
35	4	3,620	46	471	835	342	86	84	32	0	0	116	792	562
36	6	5,578	273	662	1,061	748	194	181	22	0	0	105	975	560
37	0	--	--	--	--	--	--	--	--	--	--	--	--	--
38	1	1,060	91	69	228	95	56	104	32	0	0	5	157	203
39	2	2,055	308	547	453	253	0	16	16	11	11	98	181	116
40	0	--	--	--	--	--	--	--	--	--	--	--	--	--
41	1	1,176	87	519	234	145	0	0	0	7	7	25	67	37
Total	1,431	212,703	3,181	9,758	16,343	6,605	4,096	4,628	2,573	2,964	45,547	79,968	29,669	7,371

Table 17.--Lumber grade recovery as a percentage of lumber tally volume by 1-inch diameter class for log grade 1

Log scaling diameter (inches)	Number of logs	Total lumber tally volume	B & Btr. Select	C Select	D Select	Molding	No. 3 Clear	No. 1 Shop	No. 2 Shop	No. 1 Common	No. 2 Common	No. 3 Common	No. 4 Common	No. 5 Common
Board feet														
21	1	227	4.41	30.84	4.41	19.38	0	0	0	3.52	3.52	8.37	22.03	--
22	0	--	0	--	10.37	15.06	7.90	2.72	0	--	11.11	25.68	22.22	4.94 0
23	1	--	--	--	--	--	--	--	--	--	--	--	--	--
24	0	--	--	--	--	--	--	--	--	--	--	--	--	--
25	0	--	--	--	--	--	--	--	--	--	--	--	--	--
26	0	--	--	--	--	--	--	--	--	--	--	--	--	--
27	0	--	--	--	--	--	--	--	--	--	--	--	--	--
28	1	435	1.38	1.15	9.89	0	5.98	6.44	7.36	0	0	21.38	30.57	15.86
29	1	615	0	6.83	14.63	12.03	7.80	4.88	7.80	0	.65	12.03	33.33	0
30	0	--	--	--	--	--	--	--	--	--	--	--	--	--
31	0	--	--	--	--	--	--	--	--	--	--	--	--	--
32	0	--	--	--	--	--	--	--	--	--	--	--	--	--
33	0	--	--	--	--	--	--	--	--	--	--	--	--	--
34	0	--	--	--	--	--	--	--	--	--	--	--	--	--
35	0	--	--	--	--	--	--	--	--	--	--	--	--	--
36	0	--	--	--	--	--	--	--	--	--	--	--	--	--
37	0	--	--	--	--	--	--	--	--	--	--	--	--	--
38	0	--	860	10.70	32.09	27.79	13.37	0	1.86	0	1.28	0	4.65	3.14
39	1	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	5	2,542	4.25	17.11	17.43	10.42	3.34	2.91	3.15	2.52	4.56	12.00	15.89	6.41

Table 18.--Lumber grade recovery as a percentage of lumber tally volume by 1-inch diameter class for log grade 2

Log scaling diameter (inches)	Number of logs	Total lumber tally volume	B & Btr. Select	C Select	D Select	Molding	No. 3 Clear	No. 1 Shop	No. 2 Shop	No. 1 Common	No. 2 Common	No. 3 Common	No. 4 Common	No. 5 Common	Percentage of lumber tally volume						
															Board feet	17.95	0	0	0	0	
8	39	0	17.95	0	0	0	0	0	0	0	0	0	0	0	0	17.95	51.28	12.82	0	0	0
9	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
10	62	0	0	6.45	0	0	0	0	0	0	0	0	54.84	38.71	0	0	0	0	0	0	0
11	215	0	1.40	2.79	1.40	0	0	0	0	0	0	2.33	56.28	35.81	0	0	0	0	0	0	0
12	316	3.80	0	14.56	1.58	0	0	0	0	0	0	2.53	38.29	33.23	4.75	1.27					
13	207	0	5.80	11.59	0	0	0	0	0	0	0	0	38.16	32.85	11.59	0					
14	259	0	0	6.95	0	0	0	0	0	0	0	3.09	25.10	38.61	15.44	10.81					
15	170	12.35	7.65	13.53	0	0	0	4.71	0	0	0	0	32.35	29.41	0	0					
16	350	1.71	5.14	10.86	0	0	0	0	0	16.00	0	16.00	36.57	8.29	13.71	7.71					
17	223	1.35	2.24	13.90	0	4.48	5.83	0	0	0	0	0	0	65.02	7.17	0					
18	165	3.03	21.82	21.82	2.42	0	0	0	0	0	0	0	0	0	18.79	20.61	11.52				
19	1,359	.96	11.55	14.05	.96	5.96	2.94	2.72	0	0	0	0	8.83	29.80	18.47	3.75					
20	1,199	.42	10.84	16.18	4.59	5.17	2.09	0	0	0	0	3.84	17.18	33.53	5.67	.50					
21	1,629	1.96	8.53	13.57	2.27	6.81	4.60	0	0	0	0	0	21.12	29.71	10.80	.61					
22	752	0	3.99	22.74	6.91	2.13	0	0	0	0	0	0	16.76	44.81	1.99	.66					
23	1,675	.72	3.16	19.40	8.00	6.39	1.31	3.70	2.51	0	0	0	10.09	32.90	10.15	1.67					
24	905	.44	8.07	10.50	10.83	7.07	12.93	.55	.66	0	0	0	12.04	23.20	10.83	2.87					
25	2,050	4.83	12.20	14.73	5.46	3.76	3.76	1.12	1.90	0	0	0	2.24	2.34	30.24	14.54	6.63				
26	587	2.04	19.25	16.35	7.16	3.41	10.90	0	0	0	0	0	5.79	21.47	11.41	2.21					
27	1,684	6.53	16.57	15.50	12.95	.71	.71	0	0	0	0	0	4.99	22.09	11.16	8.79					
28	2,009	8.36	14.58	13.44	13.29	1.59	2.84	.30	0	0	0	0	3.63	23.30	14.53	4.13					
29	2,191	7.35	10.04	16.02	15.24	5.61	4.38	.73	.32	0	0	0	2.28	16.34	16.84	4.84					
30	2,023	10.23	25.44	12.07	10.14	.74	1.11	0	0	0	0	0	.65	12.35	12.35	10.60					
31	4,614	2.32	13.94	23.10	9.04	0	.17	1.04	.48	0	0	0	2.49	22.19	14.78	10.45					
32	3,079	2.34	14.55	30.72	7.96	1.72	1.49	.52	.19	0	0	0	3.90	13.58	16.14	6.89					
33	1,737	13.36	26.25	19.40	13.64	2.76	2.71	0	0	0	0	0	.29	9.27	8.75	3.57					
34	1,598	7.70	16.33	15.71	7.57	0	1.00	0	0	0	0	0	4.76	27.85	14.96	3.13					
35	1,803	.33	19.52	29.67	11.20	0	.89	0	0	0	0	0	3.11	18.14	10.04	7.10					
36	2,591	2.70	16.06	23.35	16.71	.46	3.47	.85	0	0	.73	0	.73	9.38	11.96	14.32					
37	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
38	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
39	1,195	18.08	22.68	17.91	11.55	0	0	1.34	0	0	0	0	0	8.20	11.80	7.45	1.00				
40	0	--	--	--	--	--	--	--	--	--	--	--	.60	2.13	5.70	3.15	4.68				
Total	81	36,924	4.57	14.82	19.02	9.27	2.26	2.13	.77	.70	6.75	21.51	12.30	5.90							

Table 19.--Lumber grade recovery as a percentage of lumber tally volume by 1-inch diameter class for log grade 3

Log scaling diameter (inches)	Number of logs	Total lumber tally volume	Board feet					Percentage of lumber tally volume						
			B & Btr. Select	C Select	D Select	Molding	No. 3 Clear	No. 1 Shop	No. 2 Shop	No. 1 Common	No. 2 Common	No. 3 Common	No. 4 Common	No. 5 Common
4	1	14	0	0	0	0	0	0	0	0	0	0	0	0
5	4	61	0	0	0	0	0	0	0	0	32.79	26.23	31.15	9.84
6	26	489	0	0	.41	0	0	0	0	1.23	32.31	41.31	19.22	5.52
7	60	1,657	0	.97	.42	.36	0	0	0	.91	30.90	47.01	18.11	1.33
8	46	1,594	0	0	.19	0	0	0	0	.213	30.05	48.49	18.13	1.00
9	29	1,287	0	0	0	0	0	0	0	4.04	37.53	42.66	15.00	.78
10	30	1,897	0	0	.53	0	0	0	0	3.69	47.60	38.22	9.96	0
11	12	915	.55	0	2.30	0	0	0	0	.44	35.08	51.26	10.38	0
12	10	955	0	0	.42	0	0	0	0	.52	47.02	42.51	9.53	0
13	6	720	1.11	4.72	1.81	0	0	0	0	5.00	49.17	26.67	11.53	0
14	4	577	0	0	.87	0	0	0	0	1.56	48.53	36.05	11.09	1.91
15	2	293	0	0	1.02	1.71	4.44	0	0	4.44	53.24	26.62	8.53	0
16	1	204	0	0	14.71	0	0	0	0	0	7.84	61.27	16.18	0
17	0	--	--	--	--	--	--	--	--	--	--	--	--	--
18	0	--	--	--	--	--	--	--	--	--	--	--	--	--
19	1	292	0	2.05	8.90	9.25	12.67	0	0	4.79	16.44	31.51	14.38	0
20	2	593	0	.33	2.01	0	11.20	2.17	1.17	0	17.39	62.21	2.84	.67
21	0	--	--	--	--	--	--	--	--	--	--	--	--	--
22	0	--	--	--	--	--	--	--	--	--	--	--	--	--
23	0	--	--	--	--	--	--	--	--	--	--	--	--	--
24	0	--	--	--	--	--	--	--	--	--	--	--	--	--
25	1	360	2.78	4.72	15.83	0	10.00	2.78	3.33	8.06	12.22	31.94	8.33	0
26	1	501	1.60	2.00	12.77	11.98	19.36	5.79	0	0	10.58	21.56	14.37	0
27	0	--	--	--	--	--	--	--	--	--	--	--	--	--
28	0	--	--	--	--	--	--	--	--	--	--	--	--	--
29	0	--	--	--	--	--	--	--	--	--	--	--	--	--
30	0	--	--	--	--	--	--	--	--	--	--	--	--	--
31	0	--	--	--	--	--	--	--	--	--	--	--	--	--
32	0	--	--	--	--	--	--	--	--	--	--	--	--	--
33	0	--	--	--	--	--	--	--	--	--	--	--	--	--
34	0	--	--	--	--	--	--	--	--	--	--	--	--	--
35	0	--	--	--	--	--	--	--	--	--	--	--	--	--
36	1	1,017	14.26	14.75	17.80	8.55	12.09	.79	0	0	3.15	17.21	11.01	.39
Total	237	13,431	1.31	1.75	3.26	1.38	2.78	.45	.14	2.14	32.85	40.11	13.10	.74

Table 20.-Lumber grade recovery as a percentage of lumber tally volume by 1-inch diameter class for log grade 4

Log scaling diameter (inches)	Number of logs	Total lumber tally volume	B & Btr. Select	Percentage of lumber tally volume							
				D Select	Molding	No. 3 Clear	No. 1 Shop	No. 2 Shop	No. 1 Common	No. 2 Common	No. 3 Common
Board feet											
5	1	16	0	0	0	0	0	0	0	18.75	56.25
6	14	265	0	0	1.13	0	0	0	2.64	46.79	25.00
7	55	1,637	.31	.31	.31	0	0	0	.98	33.41	32.45
8	80	2,964	0	.57	.37	.47	.24	0	2.77	29.59	16.23
9	113	5,396	0	.11	.72	.37	0	0	1.76	33.86	48.18
10	108	6,649	.15	.05	.95	0	0	.06	1.05	39.10	47.59
11	104	8,660	.07	.22	.99	.25	.09	0	0	48.05	15.82
12	96	9,401	.05	.28	1.62	.09	0	0	.52	40.50	13.88
13	85	9,726	.13	.73	2.09	.31	0	.22	.35	42.82	10.45
14	77	10,200	.04	.62	1.59	.30	0	.17	.03	41.17	11.39
15	65	10,272	.12	.87	2.02	.75	.47	.66	.41	42.29	.45
16	47	8,580	.03	.93	1.84	.34	.15	.55	.72	43.32	.77
17	49	10,197	.65	2.09	3.86	1.22	.80	1.59	1.71	46.23	.67
18	31	7,550	.74	1.80	4.52	.72	1.56	1.60	1.75	46.56	12.50
19	26	6,450	0	1.38	3.30	1.13	1.57	5.49	2.54	46.56	12.77
20	23	6,616	.18	2.06	4.87	1.09	1.96	5.24	.41	47.50	1.03
21	24	7,559	.51	2.72	5.94	1.29	4.71	4.67	.72	47.93	1.05
22	16	5,464	.42	3.68	8.35	3.09	2.65	7.08	2.56	49.23	1.05
23	9	3,160	.57	.95	6.93	.85	5.95	7.44	2.81	44.53	1.05
24	11	4,602	.85	3.54	9.26	2.39	3.65	4.15	3.00	47.14	1.05
25	11	4,366	1.99	4.99	10.12	3.94	4.15	2.45	2.08	40.94	1.05
26	7	3,197	2.56	4.63	13.61	6.66	5.82	6.01	2.88	48.85	1.05
27	4	1,598	6.38	10.20	21.03	1.94	2.32	2.64	.29	37.83	1.05
28	6	3,477	3.54	5.03	9.86	5.38	4.14	2.69	1.77	51.33	1.05
29	3	1,690	4.02	6.27	22.54	4.44	6.33	9.35	.65	48.54	1.05
30	2	1,215	.66	4.03	5.68	2.72	11.28	9.30	.55	47.28	1.05
31	2	1,177	2.12	8.92	21.67	5.10	3.23	2.29	1.13	30.88	1.05
32	1	660	6.82	11.67	28.18	6.97	4.39	1.21	3.64	40.94	1.05
33	5	3,702	1.97	8.00	14.78	6.43	7.81	4.27	1.65	47.50	1.05
34	0	--	--	--	--	--	--	--	--	33.91	21.23
35	2	1,817	2.20	6.55	16.51	7.71	4.73	3.74	1.76	31.75	5.60
36	1	933	6.22	7.29	10.29	19.83	6.32	8.90	0	23.96	13.25
37	0	--	--	--	--	--	--	--	5.79	27.01	.76
38	1	1,060	8.58	6.51	21.51	8.96	5.28	9.81	3.02	14.81	1.89
Total	1,079	150,156	.74	2.09	5.01	1.62	1.80	2.34	1.39	1.56	1.66

Table 21.-Lumber grade recovery as a percentage of lumber tally volume by 1-inch diameter class for log grade 9

Log scaling diameter (inches)	Number of logs	Total lumber tally volume	Board feet						Percentage of lumber tally volume					
			B & Btr. Select	C Select	D Select	Molding	No. 3 Clear	No. 1 Shop	No. 2 Shop	No. 1 Common	No. 2 Common	No. 3 Common	No. 4 Common	No. 5 Common
12	1	63	0	0	0	0	0	0	0	0	0	49.21	19.05	31.75
13	1	123	0	0	0	0	0	0	0	0	6.50	93.50	0	0
14	0	--	--	--	--	--	--	--	--	--	--	--	--	--
15	0	--	--	--	--	--	--	--	--	--	--	--	--	--
16	1	132	0	0	0	0	0	0	0	0	0	18.18	81.82	0
17	3	553	0	1.08	.72	0	0	0	1.08	0	.72	29.29	51.18	15.91
18	2	493	0	10.75	8.72	1.62	0	0	0	1.01	9.33	17.44	19.88	31.24
19	3	605	1.16	0	4.46	2.15	0	0	2.15	0	13.55	44.79	18.02	13.72
20	2	406	0	3.20	1.72	0	3.69	0	0	14.53	32.02	18.23	26.60	
21	1	230	0	0	0	0	0	0	6.52	0	0	30.87	25.22	37.39
22	2	631	0	1.58	5.07	1.74	0	0	0	1.90	43.90	24.56	21.24	
23	1	347	0	0	4.61	0	0	3.75	0	0	0	7.20	44.09	40.35
24	1	323	0	0	6.81	0	0	0	0	0	.93	17.34	44.89	30.03
25	0	--	--	--	--	--	--	--	--	--	--	--	--	--
26	2	860	3.26	5.93	9.30	11.63	4.30	1.98	.93	0	6.28	19.77	19.77	16.86
27	1	435	0	.69	5.52	0	0	0	0	0	0	9.20	24.60	60.00
28	1	378	0	3.70	10.05	0	0	0	0	0	0	5.03	23.02	58.20
29	2	902	2.11	8.65	11.64	5.76	.89	4.10	1.33	0	0	19.73	26.94	18.85
30	2	1,084	3.14	6.64	19.65	4.06	1.57	9.69	3.04	0	1.28	10.06	27.68	14.48
31	1	392	2.55	15.56	10.97	2.04	0	3.06	4.34	0	1.28	18.37	12.50	29.34
32	0	--	--	--	--	--	--	--	--	--	--	--	--	--
33	0	--	--	--	--	--	--	--	--	--	--	--	--	--
34	1	656	0	12.65	12.96	2.74	4.88	0	0	0	0	4.73	18.75	43.29
35	0	--	--	--	--	--	--	--	--	--	--	--	--	--
36	1	1,037	0	2.70	17.26	4.15	0	0	0	0	0	29.41	29.51	16.97
Total	29	9,650	1.02	4.89	9.51	3.08	.97	2.06	1.08	.05	2.83	22.51	26.74	25.26

Table 22.--Lumber grade recovery as a percentage of lumber tally volume by 1-inch diameter class for all log grades

Log scaling diameter (inches)	Number of logs	Total lumber tally volume	B & Btr. Select	C Select			Molding	No. 3 Clear	No. 1 Shop	No. 2 Shop	No. 1 Common	No. 2 Common	No. 3 Common	No. 4 Common	No. 5 Common
				D Select	Shop	Common									
Board feet															
4	14	0	0	0	0	0	0	0	0	0	0	0	0	21.43	78.57
5	77	0	0	0	0	0	0	0	0	0	0	3.90	37.66	25.97	24.68
6	754	0	0	.66	0	0	0	0	0	0	1.72	37.40	38.20	18.17	3.85
7	3,294	.15	.64	.36	.33	0	0	0	0	0	.94	32.15	47.30	16.61	1.52
8	4,597	0	.52	.30	.30	.15	0	0	0	0	2.52	29.65	48.31	16.60	1.63
9	6,683	0	.09	.58	.30	0	0	0	0	0	2.20	34.57	47.46	14.10	.70
10	139	8,608	.12	.03	.89	0	0	.05	0	0	1.63	41.09	45.82	9.58	.79
11	119	9,790	.11	.22	1.15	.26	.08	0	0	.46	3.60	40.34	43.45	10.21	.57
12	110	10,735	.16	.24	1.88	.12	0	0	0	.32	2.00	41.36	42.09	11.08	.61
13	94	10,776	.19	1.09	2.23	.28	0	.19	.19	.32	2.26	37.04	42.58	13.14	.70
14	83	11,036	.04	.57	1.68	.28	0	.15	.15	.03	1.77	36.51	45.51	12.50	.97
15	68	10,735	.31	.95	2.18	.76	.57	.71	.39	1.05	33.89	45.75	12.45	.99	
16	51	9,266	.10	1.06	2.44	.31	.14	.51	.67	2.23	32.43	47.51	11.34	1.26	
17	53	10,973	.63	2.04	3.91	1.13	.84	1.59	1.64	2.42	26.05	46.87	11.09	1.80	
18	34	8,208	.74	2.74	5.12	.80	1.44	1.47	1.71	1.62	21.99	45.39	14.12	2.85	
19	35	8,706	.23	2.89	5.25	1.45	2.52	4.53	2.46	1.72	18.62	44.02	14.23	2.09	
20	31	8,819	.19	3.19	6.07	1.44	2.94	4.54	2.19	1.18	17.63	43.66	14.66	2.32	
21	31	9,545	.84	4.32	7.06	1.85	4.84	4.43	2.16	1.17	18.33	37.89	14.26	2.84	
22	20	6,845	.34	3.52	9.62	3.39	2.35	5.65	2.10	.23	12.27	39.16	18.04	3.33	
23	15	5,587	.54	2.24	11.12	3.45	5.48	4.83	2.63	2.56	10.69	40.95	12.30	3.22	
24	14	5,830	.74	4.05	9.31	3.57	3.98	5.28	2.45	.62	6.96	42.88	16.38	3.77	
25	17	6,776	2.89	7.16	11.82	4.19	4.34	2.07	2.10	1.46	6.05	32.31	18.60	7.02	
26	11	5,145	2.53	6.26	13.12	8.07	6.61	5.87	1.94	.70	7.83	27.58	15.65	3.85	
27	9	3,717	5.70	11.97	16.71	6.70	1.32	1.78	1.16	0	4.90	21.68	15.79	12.29	
28	12	6,299	4.72	7.73	11.02	7.21	3.21	3.48	2.78	0	5.38	26.78	19.11	8.59	
29	10	5,398	4.59	8.26	17.17	9.91	5.30	5.95	2.22	.13	3.83	16.95	20.30	5.37	
30	6	3,384	4.52	11.73	12.20	5.53	4.79	6.80	2.60	0	.59	19.36	21.84	10.05	
31	10	6,183	2.30	13.08	22.06	7.84	.61	.76	2.09	.55	3.12	22.29	14.35	10.95	
32	5	3,739	3.13	14.04	30.28	7.78	2.19	1.44	1.07	.96	4.95	14.50	13.85	5.80	
33	7	5,439	5.61	13.83	16.25	8.73	6.20	3.77	1.12	0	2.19	21.88	13.50	6.93	
34	3	2,254	5.46	15.26	14.91	6.17	1.42	.71	0	3.37	21.12	16.06	14.82	14.82	
35	4	3,620	1.27	13.01	23.07	9.45	2.38	2.32	.88	0	3.20	21.88	15.52	7.02	
36	6	5,578	4.89	11.87	19.02	13.41	3.48	3.24	.39	0	1.88	17.48	14.29	10.04	
37	0	--	--	--	--	--	--	--	--	--	--	--	--	--	
38	1	1,060	8.58	6.51	21.51	8.96	5.28	9.81	3.02	0	.47	14.81	19.15	1.89	
39	2	2,055	14.99	26.62	22.04	12.31	0	.78	.78	.54	4.77	8.81	5.64	2.73	
40	0	--	--	--	--	--	--	--	--	--	--	--	--	--	
41	1	1,176	7.40	44.13	19.90	12.33	0	0	0	.60	2.13	5.70	3.15	4.68	
Total	1,431	212,703	1.50	4.57	7.70	3.09	1.93	2.18	1.21	1.39	21.41	37.61	13.95	3.46	

The mission of the PACIFIC NORTHWEST FOREST AND RANGE EXPERIMENT STATION is to provide the knowledge, technology, and alternatives for present and future protection, management, and use of forest, range, and related environments.

Within this overall mission, the Station conducts and stimulates research to facilitate and to accelerate progress toward the following goals:

1. Providing safe and efficient technology for inventory, protection, and use of resources.
2. Development and evaluation of alternative methods and levels of resource management.
3. Achievement of optimum sustained resource productivity consistent with maintaining a high quality forest environment.

The area of research encompasses Oregon, Washington, Alaska, and, in some cases, California, Hawaii, the Western States, and the Nation. Results of the research will be made available promptly. Project headquarters are at:

Fairbanks, Alaska	Portland, Oregon
Juneau, Alaska	Olympia, Washington
Bend, Oregon	Seattle, Washington
Corvallis, Oregon	Wenatchee, Washington
La Grande, Oregon	

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The FOREST SERVICE of the U. S. Department of Agriculture is dedicated to the principle of multiple use management of the Nation's forest resources for sustained yields of wood, water, forage, wildlife, and recreation. Through forestry research, co-operation with the States and private forest owners, and management of the National Forests and National Grasslands, it strives — as directed by Congress — to provide increasingly greater service to a growing Nation.

